Rehabilitation and Health Assessment
Applying ICF Guidelines

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Throughout my 40 years in rehabilitation counseling/rehabilitation psychology, including the last 33 at the University of Wisconsin-Madison, assessment has been a primary focus of my work, and I have taught graduate courses in assessment at both the master’s and Ph.D. levels. As a result, I have become familiar with a number of the myriad of textbooks available on the topic of assessment, and I have found that they often look very similar to one another in content, organization, and format, particularly those focusing on psychological assessment. In contrast, this text, *Rehabilitation and Health Assessment: Applying ICF Guidelines*, is quite different from others.

Particularly unique is the application of assessment to the *International Classification of Functioning, Disability and Health (ICF)*. The *ICF* represents a landmark development, with official endorsement in 2001 by all 193 Member States of the World Health Organization (WHO) as an internationally accepted standard for describing health and disability. The *ICF* provides a comprehensive specification of health-related human functioning in the domains of body functions and structures, including both physical and psychological functions of body systems (e.g., mental, sensory, neuromuskuloskeletal, and movement-related functions, in addition to pain); activities and participation, ranging from basic (e.g., dressing and eating) to complex (e.g., working and living independently); and environmental factors that provide a context for understanding functioning, disability, and health.

The *ICF* holds great promise in facilitating understanding and the formulation of responses to the disability and health-related needs of both individuals and groups. For individuals, the *ICF* provides a framework for identifying and understanding rehabilitation needs and developing comprehensive service and treatment plans to address those needs. Beyond the individual level, the *ICF* can facilitate the understanding of the needs of entire communities, regions, nations, and the world as a whole, leading to the development of policies and strategies to address rehabilitation and health-related needs at broad societal levels. However, the *ICF* provides only a framework for understanding and does not identify methods or technology to conduct assessments in the domains specified, and it is this need that Mpofu and Oakland have addressed through their text, reviewing the state of the art and issues in assessment as applied to the *ICF* domains.

A reading of the table of contents of the text will clearly indicate the unique content covered. Beginning with an introductory “Part 1: Professional Issues in the ICF Context,” and concluding with a trends and future perspectives chapter in “Part 5: Looking Ahead,” the other three sections focus on assessment procedures and measures that look very different from other texts on assessment. To highlight
some examples, “Part 2: Measures and Procedures” includes chapters on real and virtual world tools for assessment of functioning, in addition to assessment of healthcare quality and costs, environmental context, predisposition and use of assistive technology, universal design, and life care planning. “Part 3: Measures of Adaptation and Adjustment” includes chapters on measures of acculturation, values, subjective well-being, pain, self-efficacy and resilience, and spirituality and religiosity. “Part 4: Measures of Participation” includes chapters on measures of physical and functional performance, community integration, sexual function, and recreation and leisure. Further, all content, to the extent possible, applies the ICF in reviewing the current state of the art in the various domains of assessment.

The authors of the individual chapters in the text represent a diversity of backgrounds and expertise, another unique feature of the book. Among the disciplines represented are rehabilitation, medical, educational, counseling, and clinical psychology; cognitive science and neuroscience; medicine; occupational therapy; social work; therapeutic recreation; disability policy; economics; public administration; measurement and statistics; and design and architecture. The authors comprise a distinguished group of authorities in their respective disciplines, and they also bring international perspectives, coming from the U.S., Canada, Australia, and Norway, with many international involvements that are directly related to the topics of their respective chapters. The broad array of disciplines represented is important in adequately addressing assessment in the various domains represented in the ICF, and international perspectives are also important.

Finally, Elias Mpofu and Tom Oakland bring particular expertise to their role as co-editors of the text. Both have long and distinguished professional and academic careers and I have had the honor and privilege to work with both of them. I have a particularly long association with Elias Mpofu, knowing him since 1995 when he came to the University of Wisconsin-Madison as a Fulbright Scholar to pursue a Ph.D. degree in our rehabilitation psychology program. I had opportunities to work with him in all aspects of his doctoral study, including serving on his dissertation committee, and he was enrolled in my core Ph.D. seminar, Assessment in Rehabilitation Psychology. Both co-editors have extensive backgrounds in assessment with both children and adults and are particularly respected researchers and scholars, with extensive international involvements, and I have the highest regard for their work, including their work in compiling and editing this text.

I see the text as an important and unique contribution to the literature on assessment in rehabilitation, disability, and health. The text reviews the state of the art in assessment, with a focus on the domains of the ICF, and it should facilitate assessment practice, while also identifying research and development needs to improve assessment procedures, measures, and practices in the various ICF domains. It should become a widely used textbook in assessment courses in a variety of rehabilitation and health-related disciplines, including those represented by the chapter authors, either as a primary or supplementary text. In addition, it should be included in the professional libraries of practitioners, academicians, and researchers in rehabilitation, disability, and health-related disciplines.

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Rehabilitation and health assessment constitutes a rapidly evolving resource, with continuous advances derived through research and other forms of scholarship, including technology, leading to a larger number of quality tests, increased awareness of the value of test data, improved professional preparation on test use, and years of dedicated service from committed professionals who artfully utilize test and other data. Advances in assessment lead to advances in personally tailored health and wellness interventions, resulting in a more rapid return to wellness and increased longevity—conditions seen more clearly in the developed countries. Changes in our clientele base and our resources for responding to their needs also are apparent.

This is an exciting time as we examine new models for describing behaviors, treating them, and linking assessment and intervention methods. For example, more infants who otherwise would have died now survive, some with chronic and others with acute rehabilitation and health needs. One the one hand, our population is aging, resulting in a significant increase in physical, mental, social, and other disorders—ones that were observed less frequently 50 years ago due to higher death rates at earlier ages. On the other hand, the aging generation is seeking health outcomes to support preferred lifestyles, making it ever more important to provide rehabilitation services that enhance the quality of life in the twilight years. The accurate assessment of the rehabilitation and health needs in an increasingly diverse and complex clientele constituency is important for accountable and evidence-based quality of care.

Global health initiatives exert a growing influence on rehabilitation and health assessment as exemplified by the wide adoption of the World Health Organization’s (2001) International Classification of Functioning, Disability, and Health (ICF), a model that promotes an understanding of the complexity of health and well-being practices. The receptivity of the ICF by those engaged in rehabilitation and other health services reflects their desire to move more fully to a multidiscipline/multiprofessional service model. The ICF provides a professionally agreed upon framework for viewing behaviors from three broad and different perspectives: physiologic, physical–environmental, and psychosocial functions. The ICF’s focus centers directly on the work of rehabilitation specialists who partner with clients to promote functional life activities and participation in social and other settings. The ICF’s de-emphasis on the exact cause of pathology or the need to diagnose also helps to reframe our work that now increasingly centers on current and future functional performance outcomes.

This is a great time to be engaged in rehabilitation science and services. Consumers prefer rehabilitation and health services that result in personally
meaningful outcomes that support their preferred lifestyle and promote full community inclusion. Moreover, the importance of subjective aspects of health to functioning is receiving increasing recognition at all levels of rehabilitation and health practices. Thus, we are engaged in the provision of rehabilitation services to a wide range of persons who display a common need and desire: to be active partners in acquiring or reacquiring and maintaining needed functional behaviors and skills, preventing loss of function, or maximizing quality of life. This book is significant in its comprehensive survey of assessment tools and procedures important to personalizing and individualizing rehabilitation and health care interventions.

This is a great time to rely on reliable and valid tests and other assessment methods to assist us in our work. The availability of an estimated 5,000 or more tests in English alone constitutes a resource that few of us developed yet most of us are able to use and rely on. Professions engaged in rehabilitation services may be the envy of other professions that lack these resources and thus must continue to rely on less reliable and valid methods when making professional decisions. Rehabilitation and Health Assessment: Applying ICF Guidelines reflects these themes.

The contributing authors were selected due to their renowned expertise in rehabilitation and health assessment. Most have a solid scientist–practitioner understanding of using assessment to promote health and well-being rather than engaging merely in ameliorating symptoms of the disease, illness, or disability. The contributing authors were selected carefully to reflect the diversity of backgrounds of professionals in rehabilitation and health, including research and practice in rehabilitation services, rehabilitation counseling, communication and speech disorders, engineering, health economics, ethics and law, occupational therapy, physiotherapy, physical medicine and rehabilitation, psychology, neuropsychology, leisure and recreation, policy studies, and public health. Our science and services increasingly reflect multidiscipline/multiprofessional efforts. It is imperative for both pre-service and in-service rehabilitation and health professionals to keep abreast of assessments to support effective services.

Rehabilitation and Health Assessment: Applying ICF Guidelines is designed to meet the needs of students in upper division and graduate courses that provide foundation knowledge and skills in measurement and assessment. It also is intended to serve as a resource for professional researchers and practitioners who want to refresh or advance their knowledge and practice. Additionally, consumers of rehabilitation services who seek to understand the evidentiary basis of the assessment procedures that influence specific services are likely to find this book is an excellent resource.

Chapter content addresses issues important to young children through the elderly. Aspects of rehabilitation science and practice addressed in this book focus more on adults with chronic health care needs than on children. Although the content of this book necessarily reflects this somewhat skewed emphasis, the inclusion of chapters on the ICF for children and youth reflect our interest in them. The contents of other chapters also are relevant to this younger age group.

The book’s title, Rehabilitation and Health Assessment: Applying ICF Guidelines, was selected deliberately to provide focus to the use of test data in light
of the ICF. Chapter authors were asked to discuss their topic, when possible, in ways that promote an understanding of test use within an ICF framework. This is a tall request. Very few tests were designed, standardized, and normed to be consistent with this model. Thus, at this time, scholars and practitioners mainly can examine how existing resources may align and be used within the ICF model.

This book does not provide a list of tests that can be used in ways consistent with the ICF. In fact, the development of tests that fully implement the ICF is an evolving professional activity. Tests are tools to be used skillfully and respectfully by experienced professionals. When they are reliable and valid, tests can assist professionals in decision making. Thus, given the complex nature of the ICF, professionals will continue to be the decision makers who rely on assessment, a process much broader and complex than test use. Rehabilitation and health professionals must avoid becoming psychometricians—those who focus exclusively on test data and not on the individual client and his or her environment.

We believe most chapters advance an understanding of test use in the context of rehabilitation science and practice and within an ICF model. The first four chapters discuss professional issues in the ICF context. Chapter 1, “Concepts and Models in Disability, Functioning, and Health,” provides a foundation for the other 30 chapters. The discussion of the International Classification of Functioning, Disability, and Health: Children & Youth Version (ICF-CY; WHO, 2007) by one of the ICF-CY authors provides information rarely found elsewhere in summary form. An understanding of important ethical, cultural, and diversity issues promotes an understanding of the broader context of our work.

Chapters included in Part 2: Measures and Procedures reflect recent advances that add to the diverse ways in which tests and other assessment methods impact services. For example, item response theory may bring new perspectives to assessment for some readers. Topics such as virtual world tools, functional magnetic resonance imaging, and universal design were not widely known 20 years ago. Information on assessment of capacity, life cares planning, and program evaluation lies at the heart of many rehabilitation services.

The concepts of adaptation/adjustment as well as participation are a centerpiece in rehabilitation services, are important in the ICF, and are addressed in this book. Part 3 focuses on measures of adaptation and adjustment. Services commonly strive to assist clients in acquiring, restoring, or maintaining functional adaptive skills and behaviors. The process of examining the concepts of adaptation and adjustment may be similar to the process of examining light through a prism. These concepts are multifoci in nature and better understood by knowing about assessment of adaptive behaviors in young children, values, subjective well-being, pain, forgiveness, self-efficacy and resilience, spirituality and religiosity, and perfectionism—that is, the topics addressed in Part 3.

Part 4, Measures of Participation, focuses on the actual display of desired behaviors in the contexts within which society expects them to occur. Topics include physical performance, community integration, society safety, sexual functioning, and health literacy. These issues impact a person’s ability to participate in meaningful ways at home, in the neighborhood, and in the community.

The editors and chapter authors were committed to producing a book that would be of value to those entering the profession as well as to the more sea-
soned professionals. Various instructional features aid in the acquisition, retention, and application of chapter information.

Chapters open with a brief overview followed by a delineation of key learning objectives that highlight key concepts, terms, and information found in the chapter. Discussion and research boxes are used to promote an understanding and application of information. Many chapters include case studies or vignettes as well learning exercises and field-based experiential assignments to further illustrate key information.

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Thomas Oakland
*February 2009*

References

Overview

This chapter reviews the historical and contemporary concepts, terms, and scholarship associated with disability, health, and functioning in rehabilitation and health-related services. We believe that an understanding of key concepts in disability, health, and functioning will encourage an appreciation of assessment procedures used in rehabilitation and health by providing a common language that bridges disciplinary perspectives (see Peterson & Kosciulek, 2005; Peterson & Rosenthal, 2005a; World Health Organization [WHO], 2001). For example, common concepts and language among a multidisciplinary rehabilitation team and customers alike facilitate shared understanding of intervention goals, procedures, and outcomes, thus improving the potential of quality care when different disciplines share a common taxonomy and related knowledge base.
Learning Objectives

By the end of the chapter, the reader should be able to:

1. Outline historical conceptions of health, functioning, and disability;
2. Explain how disability, health, and functioning are conceptualized from the perspective of WHO’s ICF, and ICD;
3. Apply the conceptual framework of the ICF to the classification of functioning, health, and disability; and
4. Evaluate the potential of multidisciplinary applications of the ICF to classification of health and functioning.

Introduction

The International Classification of Functioning, Disability, and Health (ICF; WHO, 2001) provides core concepts in disability, health, and functioning that are increasingly embraced in the rehabilitation and health community. In this chapter, we present the ICF as the international standard for classification of disability, health, and functioning.

The ICF is not an assessment system. It is “a classification of human functioning and disability” (WHO, 2001, p. 21). Classification systems used in health care map the domains of functioning that become the target for detailed investigation using clinical assessment tools. The goals of assessment in rehabilitation and health are to describe the health status–related qualities within domains of functioning. Rehabilitation interventions are intended to maintain functioning, prevent the loss of functioning, and enhance recovery and independence (Stucki, Üstün, & Melvin, 2005). Accurate classification of functioning will inform assessment within domains of functioning and related rehabilitation interventions. Üstün, Chaterji, Bickenbach, Kastanjsek, and Schnieder (2003) wrote that “[t]he ICF is shown to be an essential tool for identifying and measuring efficacy and effectiveness of rehabilitation services, both through functional profiling and intervention targeting” (p. 565). The primary goal of this chapter is to consider the assessment implications of the ICF, broadly construed.

We present a brief historical overview of models of health care as a context for assessment of health, functioning, and disability, and we review the ICF within the context of its applications in health care. We conclude the chapter with a discussion regarding current and future implications for practice and research, including future multidisciplinary applications of the ICF to classifying disability, health, and functioning.

Historical Conceptualizations of Disability, Health, and Functioning

Several models of health care have influenced professional thinking over the years: the medical model, social model, and biopsychosocial model (Peterson & Elliot, 2008). We consider each of these models in this section, as they relate
Concepts and Models

to contemporary definitions of disability, health, and functioning according to the ICF.

Models of Disability, Functioning, and Health

According to the medical model, disability, health, and functioning are to be explained primarily by objective physical qualities of a person. Therefore, disability is from impairment of anatomical structures from disease or physical trauma, health is the absence of disease, and functioning is explained by residual physical capacity and performance following impairment. The medical model of disability suggests that disability is a personal aspect that could be evaluated and defined or diagnosed and is the focus of a health care intervention that seeks to ameliorate or eliminate the condition. It focuses on the diagnosis and treatment of disease, disorder, or injury (WHO, 2001).

The medical model influenced the development of the International Classification of Impairments, Disabilities, and Handicaps (ICIDH; WHO, 1980; see also Brandsma, Lakerveld-Heyl, & Van Ravensberg, 1995; De Kleijn-De Vrankrijker, 2003), the forerunner of the ICF. For instance, the ICIDH defined impairment as a problem in body function and structure due to a significant deviation or loss. Handicap was defined as a barrier in the environment, and disability was the manifestation of impairment within the environment. These definitions were strongly influence by the medical model, having a “problem” orientation, without much reference to healthy functioning. The 1990 Americans with Disabilities Act (ADA) was developed using two key terms that paralleled their use with the ICIDH: impairments and disability (Nieuwenhuijsen, 1995). The International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) is also a good example of the medical model’s influence on the classification of health (WHO, 1992). In existence since 1893, the ICD-10 provides an etiological (pertaining to causes) classification of health conditions (e.g., diseases, disorders, injuries) related to mortality and morbidity.

A growing body of research suggests that diagnostic information alone may not adequately reflect an individual’s health condition (Basset, Chase, Folstein, & Regier, 1998; Burns, 1991; Gatchel, Polatin, Mayer, & Garcy, 1994; Massel, Liberman, Mintz, & Jacobs, 1990; McCrone & Phelan, 1994; National Advisory Mental Health Council, 1993; Ormel, Oldehinkel, Brilman, & vanden Brink, 1993; Rabinowitz, Modai, & Inbar-Saban, 1994; Segal & Choi, 1991). Further, medically diagnosed diseases or impairments may manifest differently across individuals, and similar functioning does not imply similar diagnoses (WHO, 2001).

Leonardi, Bickenbach, Üstün, Kostanjsek, and Chatterji (2006) stated that it is important to distinguish between objective descriptions of the “disability experience” and an individual’s satisfaction with that experience (p. 1220). They assert that these distinctions are of equal importance in health and related policy considerations, but “data about disability are objective descriptions that differ from subjective appraisals.” They go on to argue, “Data about quality of life, wellbeing, and personal satisfaction with life are useful for health and policy planning; but these data are not necessarily predicted by the presence or extent of disability” (p. 1220).

Although the medical model continues to be influential, its limitations and disability activism gave rise to a competing social model of health care and
Professional Issues in the ICF Content

Disability. The social model considers the role of environmental facilitators and barriers in health and functioning. The social model of disability, health, and functioning considers the environment the "major determinant of individual functioning" (Pledger, 2003, p. 281). It proposes that disability is a social construct, impairment as it manifests in a given context in society, and suggests that disability in and of itself is not problematic, but societal attitudes and barriers can be so. Health status is not limited to being a personal attribute; it also includes the interaction between the individual's functioning and the environment (Hurst, 2003; Smart, 2005; WHO, 2001), which is influenced by societal attitudes and barriers in the environment.

The social model is most preferred by advocates for the civil rights of persons with disability (Olkin, 1999). From a social model, it is critically important that inequalities from the experience of disability are identified, measured, and ultimately remedied. According to Leornadi et al. (2006), "inequality can only be identified by comparison of people who benefit from the way society is organized with those who do not benefit" (p. 1220). However, a classical social model perspective would underemphasize assessment and focus on social constructions of disability, health, and functioning disability and the consequences of those constructions on individuals and society. The underemphasis on assessment by proponents of the social model may result from regard of psychological methods as part and parcel to the medical model, which overlooks important personal and contextual factors (see Hansen, 2004; Peterson & Elliott, in press; see also Olkin & Pledger, 2003).

A model of health care and disability that incorporates useful aspects of both the medical and social models is the biopsychosocial model (Peterson &
Elliott, 2008; Peterson & Rosenthal, 2005b; Simeonsson et al., 2003; Ueda & Okawa, 2003), which integrates diagnostic information (medical and psychological) with psychosocial aspects of life (e.g., personality traits, coping abilities, stress, and social support; see Elliott, Kurylo, & Rivera, 2002), giving equal consideration to all factors impacting health and functioning. The biopsychosocial perspective is consistent with contemporary rehabilitation processes and practice (Frank & Elliott, 2000; Parker, Szymanski, & Patterson, 2005; Peterson & Elliott, 2008; Rubin & Roessler, 2000). The biopsychosocial model does not discount either perspective but integrates them into contemporary conceptualizations of disability, health, and functioning.

The biopsychosocial model affected the evolution of the ICIDH to its current iteration, the ICF. The ICF’s conceptual framework illustrates how facilitators and barriers in the environment interact with and influence health and functioning. Consistent with values proposed by the social model, ethical use of the ICF requires that the individual’s appraisals of environmental assets and liabilities, personal body functions, and his or her ability to participate in desired personal and social activities are considered along with professional classification of functioning, disability, and health (see Peterson & Threats, 2005; WHO, 2001; see also Figure 1.1). The change in title from ICIDH to ICF is consistent with the shift away from a focus on the “consequence of disease” to “functioning as a component of health” (Üstün et al., 2003, p. 566).

1.1 Interactions between the components of ICF.

Contemporary Conceptualization of Disability, Health, and Functioning

The ICF defines disability as “an umbrella term for impairments, activity limitations and participation restrictions. Functional limitations occur as a result of the interaction between an individual (with a health condition) and that individual’s contextual factors (environmental and personal factors)” (WHO, 2001, p. 17). Impairments, according to the ICF, are the manifestations of dysfunction in the body structures or functions. Etiology of dysfunction is not the focus of the ICF; it is the focus of its sister classification, the ICD-10; the ICF does not focus on the underlying pathology itself. Impairments do not necessarily imply the presence of a disorder or disease but “represent a deviation from certain generally accepted population standards” of functioning (WHO, 2001, p. 12). Determination of impairment is made by “those qualified to judge physical and mental functioning according to these standards” (p. 12). Disability, then, refers to “the outcome or result of a complex relationship between an individual’s health condition and personal factors, and of the external factors that represent the circumstances in which the individual lives” (WHO, 2001, p. 17). Disability is meant to focus on the individual, societal, and body-related aspects of impairments, activity limitations, and participation restrictions in the environment.

According to the ICF, the term health refers to components of health that are typically a focus of health care professionals, for example, seeing, hearing, speaking, remembering, learning, and walking. Further, the ICF delineates health-related components of well-being that are not typically a focus of health care systems, such as labor, education, employment, social interactions, and transportation. The ICF was not designed to classify disability exclusively; it classifies health and health-related states that make up a universe of well-being. The ICF encourages flexibility to accommodate different conceptualizations of health and health-related states (WHO, 2001). Its focus is on human functioning, and the components of health make it universally applicable regardless of health condition (Bickenbach, Chatterji, Badley, & Üstün, 1999).

Within the ICF, the term impairment (a problem with a body function or structure) was redefined as an activity limitation, and the term handicap was replaced with the term participation restriction, meaning a problem an individual may experience in life situations due to environmental influence. Impairment here refers to a significant variation from established statistical norms (i.e., as a deviation from a population mean; WHO, 2001, p. 213). According to Leonardi et al. (2006), “Impairments are interactions affecting the body; activity limitations are interactions affecting individual’s actions of behavior; participation restrictions are interactions affecting person’s experience of life” (p. 1220). Disability, then, can be conceptualized in terms of activity limitations and participation restrictions.

The ICF Conceptual Framework

The ICF describes the situation of the person being evaluated within an array of health or health-related domains, which are practical and meaningful sets of related physiological functions, anatomical structures, actions, tasks, or areas of life within a given context. The ICF classifies both limitations in functioning and positive experiences with respect to bodily functions, activities, and
participation in the environment (e.g., communicating, tending to personal hygiene, working, and studying; WHO, 2001).

The model of functioning proposed in the ICF suggests dynamic and reciprocal relationships between the various health-related conditions within the context of environmental and personal factors. Both functioning and disability are conceptualized within the dynamic interaction between health conditions and contextual factors. Figure 1.1 provides an illustration of the components and interactions that can be used to describe the relationship between disability and functioning (WHO, 2001, p. 18).

ICF Structure

There are two versions of the ICF: the full version, which provides four levels of classification detail, and the short version, which provides two levels of classification. The units of classification are qualified with numeric codes that specify the magnitude or extent of disability or function in a given category, or, within the case of environment, the extent to which a factor in the environment is a facilitator or a barrier. Once someone becomes familiar with the basic structure of the ICF, the user can search purposefully for information related to health and functioning in different domains (Peterson, 2005). In addition to an alphabetical index available in the hardcopy version of the ICF, WHO created an electronic version of the ICF that is searchable through the ICF browser or CD-ROM (WHO, 2001).

The ICF is made up of two parts, each with two components. The first part of the ICF describes the individual via Functioning and Disability, and the second part addresses Contextual Factors. Respective components are further divided into chapters that contain categories of function within a given domain of health and health-related states.

Part 1: The Individual

Part 1 addresses the individual with respect to functioning and disability and comprises two components. The Body component consists of two parallel classifications: Body Functions and Body Structures. The second component, Activities and Participation, covers domains of functioning from both an individual and societal perspective.

The two components of functioning within the first part of the ICF can be expressed either as nonproblematic functioning or as disabilities (i.e., impairment, activity limitation, or participation restriction) and are operationalized through four separate but related qualifiers. Body functions and structures are interpreted through changes in physiological systems or anatomical structures, and activities and participation are interpreted through capacity and performance. These qualifiers are elaborated upon further in their respective sections.

Part 2: The Context

The second part of the ICF classification describes Contextual Factors through two components: Environmental Factors and Personal Factors. Environmental Factors are factors in the physical, social, or attitudinal world ranging from the
immediate to more general environment. These factors are qualified as either facilitating or hindering functioning. The second component, Personal Factors, is not currently classified in the ICF due to the complex nature of social and cultural variation (WHO, 2001). A summary of the ICF core structure is illustrated in Table 1.1.

Levels of Classification

Each ICF code is designed to be mutually exclusive. The classes and subclasses reflect the various levels that make up the hierarchical order of the ICF, with more basic levels comprising all aspects of more detailed levels (WHO, 2001). Domains within the ICF are practical and meaningful sets of related physiological functions (including psychological functions) and anatomical structures, as well as actions, tasks, and areas of life described from bodily, individual, and societal perspectives that make up the different chapters within each component of the ICF. Essential attributes of the domains (e.g., qualities, properties, and relationships) are defined by both inclusions and exclusions.

The one-level classification of the ICF expands on the core structure: (1) the Body Functions component contains eight chapters that address “physiological functions of body systems (including psychological functions)” (WHO, 2001, p. 12); (2) the Body Structures component contains eight chapters that parallel the Body Functions component and deal with “anatomical parts of the body such as organs, limbs, and their components” (p. 12); (3) the Activities and Participation component contains nine chapters, with Activities addressing “the execution of a task or action by an individual” and Participation addressing “involvement in a life situation” (p. 14); and (4) the Environmental Factors component contains five chapters focusing on “the physical, social, and attitudinal environment in which people live and conduct their lives” (p. 171), organized from the immediate to more general environment. The categories of function for a given domain begin at a general level of detail and expand to levels of greater detail. The one-level classification is further illustrated in Table 1.2.

The two-level classification, the first branching level of the ICF, has specific chapter headings. Alphanumeric codes begin with a letter (b for Body Functions, s for Body Structures, d for Activities and Participation, and e for Environmental
# 1.2 ICF: One-Level Classification

<table>
<thead>
<tr>
<th>Components:</th>
<th>Body Functions</th>
<th>Body Structures</th>
<th>Activities and Participation</th>
<th>Environmental Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code letter:</td>
<td>b</td>
<td>s</td>
<td>d</td>
<td>e</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Mental functions</th>
<th>Structures of the nervous system</th>
<th>Learning and applying knowledge</th>
<th>Products and technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 2</td>
<td>Sensory functions and pain</td>
<td>The eye, ear, and related structures</td>
<td>General tasks and demands</td>
<td>Natural environment and human-made changes to environment</td>
</tr>
<tr>
<td>Chapter 3</td>
<td>Voice and speech functions</td>
<td>Structures involved in voice and speech</td>
<td>Communication</td>
<td>Support and relationships</td>
</tr>
<tr>
<td>Chapter 4</td>
<td>Functions of the cardiovascular, hematological, immunological, and respiratory systems</td>
<td>Structures of the cardiovascular, immunological, and respiratory systems</td>
<td>Mobility</td>
<td>Attitudes</td>
</tr>
<tr>
<td>Chapter 5</td>
<td>Functions of the digestive, metabolic, and endocrine systems</td>
<td>Structures related to the digestive, metabolic, and endocrine systems</td>
<td>Self-care</td>
<td>Services, systems, and policies</td>
</tr>
<tr>
<td>Chapter 6</td>
<td>Genitourinary and reproductive functions</td>
<td>Structures related to the genitourinary and reproductive systems</td>
<td>Domestic life</td>
<td></td>
</tr>
<tr>
<td>Chapter 7</td>
<td>Neuromusculoskeletal and movement-related functions</td>
<td>Structures related to movement</td>
<td>Interpersonal interactions and relationships</td>
<td></td>
</tr>
<tr>
<td>Chapter 8</td>
<td>Functions of the skin and related structures</td>
<td>Skin and related structures</td>
<td>Major life areas</td>
<td></td>
</tr>
<tr>
<td>Chapter 9</td>
<td></td>
<td></td>
<td>Community, social, and civic life</td>
<td></td>
</tr>
</tbody>
</table>

Factors) and a three-digit numeric classification indicating chapter and specific categories within each chapter. For example, the classification associated with the psychological function of emotion is found in the first chapter of Body Functions (its code begins with “b”) under the Specific mental function section, called Emotional functions, or alphanumeric code b152 (WHO, 2001).

The more Detailed Classification with Definitions lists all categories within the ICF along with their definitions, inclusions, and exclusions, providing specificity using four- and five-digit numeric codes. Examples of level of detail within emotional functions could include Appropriateness of emotion (b1520), Regulation of emotion (b1521), and Range of emotion (b1522). Code groups also offer Other specified (e.g., b1528) and Unspecified (e.g., b1529) codes for functions not detailed in the current classification (WHO, 2001). As units of classification become more detailed, they share the attributes of the broader units above them. For example, Range of emotion, b1522, shares the attributes of the higher level of classification Emotional functions, b152.

Body Functions and Structures

The Body Functions and Structures component of the ICF comprises two classifications: physiological functions of body systems, or body functions (including psychological functions); and anatomical parts of the body, or body structures (e.g., organs, limbs, and their components). They are separate but parallel chapters (see Table 1.2). Within Body Functions, “hearing functions” has a parallel structure within Body Structures of “ear and related structures.” Both classifications are arranged according to the same body system taxonomy. The criteria for impairment are the same for body functions and structures and are classified according to (a) loss or lack, (b) reduction, (c) addition or excess, and (d) deviation.

Impairments are further qualified in terms of severity. Codes have no meaning without the use of qualifiers, which are one or more numbers indicated after a multilevel code, separated by a decimal point or separator, indicating a magnitude or level of health for a given code. The Body Function component uses a generic qualifier that addresses severity through values ranging from 0 through 4 indicating, respectively, “NO,” “MILD,” “MODERATE,” “SEVERE,” and “COMPLETE” impairment (WHO, 2001, p. 47). Relevant to all components of the ICF, qualifiers describe the extent of problems for a given code using this same generic scale with slight modifications depending upon the component qualified (i.e., substituting the term problem with “impairment” or “barrier” or “facilitator” depending upon the context). See Table 1.3 for an example of the ICF generic qualifiers.

The Body Structure component uses the generic qualifier as a first qualifier, and a second qualifier to indicate the nature of the change in a body structure as follows: 0 = no change in structure; 1 = total absence; 2 = partial absence; 3 = additional part; 4 = aberrant dimensions; 5 = discontinuity; 6 = deviating position; and 7 = qualitative changes in structure, including accumulation of fluid (WHO, 2001, p. 105). A third qualifier indicates the location of impairment as follows: 0 = more than one region; 1 = right; 2 = left; 3 = both sides; 4 = front; 5 = back; 6 = proximal; and 7 = distal. All three qualifiers have a “not specified” (8) and a “not applicable” (9) qualifier as appropriate.
### Activities and Participation, and Capacity and Performance

The second component under Functioning and Disability, which is Activities and Participation, classifies nine domains of different aspects of functioning from both individual and societal perspectives (see Table 1.2). In all instances, the Body Functions and Structures component is intended to be used with the Activities and Participation component.

**Activity** is defined as the execution of a task or action by an individual, such as sitting, copying, calculating, or driving. **Participation** is involvement in a life situation. As with the term *impairment*, **Activity limitations and Participation restrictions** “are assessed against a generally accepted population standard” for someone without a similar health condition (WHO, 2001, p. 15).

The ICF proposes four possible conceptualizations of the relationship between activities and participation. First, the user can code each category as either an activity or participation issue, resulting in two mutually exclusive lists, which is how Australia conceptualizes it in its clinical implementation manual (see http://www.aihw.gov.au/disability/icf). Alternatively, one can use the domains for both activity and participation simultaneously or as an overlapping list, which is how the U.S. version of a clinical implementation manual in progress is proceeding (Reed et al., 2005; Threats & Worrall, 2004). Two other variations between separate and overlapping lists will not be discussed here, but are referred to in Annex 3 of the ICF.

The domains of the Activities and Participation component are operationalized through the use of the qualifiers **capacity** and **performance**. The capacity qualifier “describes an individual’s ability to execute a task or an action,” or more specifically, “the highest probable level of functioning that a person may reach in a given domain at a given moment” (WHO, 2001, p. 15). One must apply the

### Generic Qualifiers

<table>
<thead>
<tr>
<th>Code</th>
<th>Extent</th>
<th>Qualitative Descriptors: impairment, limitation, restriction, barrier</th>
<th>Percentages*</th>
</tr>
</thead>
<tbody>
<tr>
<td>xxxx.0</td>
<td>NO problem</td>
<td>none, absent, negligible…</td>
<td>0–4%</td>
</tr>
<tr>
<td>xxxx.1</td>
<td>MILD problem</td>
<td>slight, low…</td>
<td>5–24%</td>
</tr>
<tr>
<td>xxxx.2</td>
<td>MODERATE problem</td>
<td>medium, fair…</td>
<td>25–49%</td>
</tr>
<tr>
<td>xxxx.3</td>
<td>SEVERE problem</td>
<td>high, extreme…</td>
<td>50–95%</td>
</tr>
<tr>
<td>xxxx.4</td>
<td>COMPLETE problem</td>
<td>total…</td>
<td>96–100%</td>
</tr>
<tr>
<td>xxxx.8</td>
<td>not specified</td>
<td></td>
<td></td>
</tr>
<tr>
<td>xxxx.9</td>
<td>not applicable</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Percentages are to be calibrated in different domains with reference to relevant population standards as percentiles. "Having a “problem” may mean an impairment, limitation, restriction, or barrier, depending on the construct." (WHO, 2001, p. 222) "xxxx" is an exemplar that stands for a given second-level domain number within the ICF classification code, which precedes the qualifier (Adapted from WHO, 2001, p. 22).
capacity qualifier in the context of a “‘uniform’ or ‘standard’ environment that thus reflects the environmentally adjusted ability of the individual” (p. 15). In order to make international comparisons, such environments have to be defined similarly across countries. A heuristic for capacity could be what a person can do.

The performance qualifier describes “what a person does in his or her current environment” (p. 15). Another way to describe this qualifier is as “involvement in a life situation” or “the lived experience” of a person in the environment (p. 15). A heuristic for performance could be what a person does do.

Differences between capacity and performance can be used to target discrepancies in functioning and to formulate what could be done to an individual’s environment in order to maximize his or her ability and function and to increase opportunity for full participation in society. The performance and capacity qualifiers are rated on the same 0 to 4 scale as the generic qualifier, substituting the term difficulty for impairment. Performance and capacity can be considered both with and without assistive devices or personal assistance, forming four possible scenarios (performance with and without assistance, and capacity with and without assistance).

**Contextual Factors**

Environmental factors (the physical, social, and attitudinal worlds) are classified within the ICF in terms of whether they facilitate or hinder functioning. Environmental Factors are organized into three levels: the individual level (e.g., support network), the services level (e.g., vocational rehabilitation), and the cultural/legal systems level (e.g., world views, laws). Table 1.2 lists the five chapters of Environmental Factors.

Environmental factors are qualified on a scale not unlike the generic scale, ranging from 0 to 4—NO to COMPLETE—substituting barrier or facilitator for the impairment or problem in previously reviewed qualifiers. Positive environmental support or facilitators are noted with a plus sign; barriers follow the decimal point unaltered. One can use the Environmental Factors coding to describe an individual’s mobility within the community, whether they are able to access public transit effectively to travel where needed (facilitator), or whether the individual is reliant on others for transportation (barrier). Societal forces can be captured through classification of the impact of prevailing attitudes toward disability, which can either create barriers or facilitate inclusion of people with disabilities.

The Personal Factors component of the ICF is currently defined by personal characteristics such as gender, race, age, fitness, religion, lifestyle, habits, upbringing, coping styles, social background, education, profession, past and current experience, overall behavior pattern and character, individual psychological assets, and other health conditions (WHO, 2001). It is clear that all of these descriptors can impact health and functioning, and users are encouraged to consider these issues qualitatively while classifying other areas of health and functioning. Thus, while the ICF classifies aspects of human health and some health-related components of well-being, it does not classify personal circumstances such as socioeconomic status, race, gender, religion, or culture that may restrict full participation in society for reasons not related to health. The Personal Factors component within the conceptual framework of the ICF,
while not currently classified, highlights the need to consider complex social circumstances that may influence the information that is classified. Table 1.4 provides an overview of the many ICF concepts presented. Inspection of the table highlights the positive aspects of health and functioning, including concepts that are consistent with the medical model, reflecting the biopsychosocial model that informs the ICF conceptual framework.

### 1.4 Overview of the ICF

<table>
<thead>
<tr>
<th>Two Parts: (A dynamic interaction)</th>
<th>Part 1: Functioning and Disability</th>
<th>Part 2: Contextual Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Each part has two components:</td>
<td>Body Functions and Structures</td>
<td>Environmental Factors</td>
</tr>
<tr>
<td></td>
<td>Activities and Participation</td>
<td>Personal Factors</td>
</tr>
<tr>
<td><strong>Domains</strong> (Contain the categories or units of classification of the ICF)</td>
<td>1. Body Functions (including psychological functioning)</td>
<td>Life areas (tasks, actions)</td>
</tr>
<tr>
<td></td>
<td>2. Body Structures</td>
<td></td>
</tr>
<tr>
<td><strong>Constructs</strong> (Defined through use of qualifiers that modify the extent or magnitude of function or disability)</td>
<td>Change in body function (physiological)</td>
<td>Capacity: Executing tasks in a standard environment (“can do”)</td>
</tr>
<tr>
<td></td>
<td>Change in body structure (anatomical)</td>
<td>Performance: Executing tasks in the current environment (“does do”)</td>
</tr>
<tr>
<td><strong>Positive Aspect</strong></td>
<td>Functioning</td>
<td>Facilitators</td>
</tr>
<tr>
<td>Activities</td>
<td>Functional and structural integrity</td>
<td></td>
</tr>
<tr>
<td>Participation</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Negative Aspect</strong></td>
<td>Disability</td>
<td>Barriers/ hindrances</td>
</tr>
<tr>
<td>Impairment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity limitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participation restriction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Units of classification are situations, not people* (Adapted from WHO, 2001, p. 11). From ICF: International Classification of Functioning, Disability and Health (p. 11), by the World Health Organization, 2001, Geneva: Author. Adapted with permission.
Great interest has been expressed by a variety of stakeholders to further develop this component of the ICF (e.g. Hurst, 2003; Institute of Medicine, 2007). In its current iteration, these issues must be considered because they may affect the outcome of a given health care intervention when classifying health and functioning using the ICF. Much work remains to be done with respect to incorporating the subjective and ipsative nature of an individual’s health, functioning, and disability being classified through the ICF taxonomy.

**Discussion Box 1.2**

**BRIEF EXAMPLE OF THE GENERATION OF AN ICF CODE**

A health care recipient has survived a motor vehicle accident in which she lost her left arm at the elbow. An orthopedic surgeon or physiatrist could begin to classify the patient’s health status with respect to body structure using an ICF “s” code “Structures related to movement,” specifically, s73018, “Structure of the forearm, other specified.” With the structural focus established, the surgeon would further describe her health status with the qualifier “COMPLETE impairment,” indicated by adding the first qualifier code after a decimal point, “.4.” Because the forearm is missing, the first qualifier would be followed by the second qualifier “1” to indicate “total absence” of the forearm. A third qualifier would be added to the ICF code to indicate the location of the absence as “left” forearm, or the number 2. The complete code would be written as s73018.412.

Related ICF codes would be generated to establish resultant functioning (via the “b” codes of body functioning, which parallel the “s” code, see Table 1.3), the person’s ability to be active and participate in the environment (“d” codes of activities and participation, used in tandem with the “s” and “b” codes), and the degree to which the environment presents as a facilitator or a barrier (via the “e” codes). As described previously, each unique code generated is followed with a qualifier to indicate level of severity if impairment exists. Finally, the Personal Factors component of the ICF’s Contextual Factors, while not currently classified but part of the ICF conceptual framework, reminds us to consider unique individual circumstances and their impact on overall health and functioning.

This brief example may suggest that coding with the ICF is quite complex at first and requires appropriate guidance and training. See the clinical implementation discussion later in this chapter for details on appropriate training for effective use of the ICF.

What kinds of issues would you imagine as a focus of clinical attention for this woman who is missing her left forearm? What other body structures might become involved? How might her impairment limit her capacity to perform within her social environment? What environmental facilitators or barriers might be present?
Impact of and Benefits of Using the ICF

The ICF has influenced many health care entities internationally. It is now in use in several countries including the United States, Australia, Canada, and the Netherlands (Bickenbach, 2003; Holloway, 2004, Peterson & Rosenthal, 2005b). Canada adopted the ICF through the Canadian Institute for Health Information, and the Australian Institute of Health and Welfare has applied the ICF to its national data dictionaries (Madden, Choi, & Sykes, 2003). Work on the World Health Survey, built upon the ICF conceptual framework, has been implemented in 74 countries (Üstün et al., 2003). In the United States, the ICF framework had a direct impact on the scope of practice statement for the speech language pathology profession (American Speech-Language-Hearing Association, 2004; Threats, 2003) and has influenced activities related to data collection, framing assessment interventions, measuring clinical research outcomes (Threats, 2002), and investigating the role of communication in the quality of life (Threats & Worrall, 2004).

Contemporary literature reviews addressing the ICF suggest that there is a growing body of scholarship supporting the potential utility of the ICF (see Bruyère, Van Looy, & Peterson, 2005; Peterson, 2005). Posited applications of the ICF include:

1. The ICF can improve communication between different users, such as health care workers, researchers, policy makers, and the public, including people with disabilities” (WHO, 2001, p. 5).
2. The ICF provides the basis for a systematic coding scheme for global health information systems.
3. Data from ICF-based systems can be used to identify facilitators and barriers that affect the full participation of people with disabilities in society.
4. Research using ICF structure may permit comparison of data across countries, health care disciplines, services, and time.
5. Data from the ICF can contribute to an international database of scientific knowledge of health and health-related states, thus stimulating research on the consequences of health conditions.
6. The ICF can be used to create informative profiles of an individual’s functioning, disability, and health, and such data can enhance health care service provision. (Reed et al., 2005)

Üstün and associates (2003) predicted that “(t)he ICF will become the generally accepted framework to describe functioning in rehabilitation” (p. 567).

Future Directions in ICF Research and Practice

To date, the ICF has been used as a statistical tool for population studies and in systems of information management; as a research tool to measure outcomes, environmental factors, and quality of life; as a clinical tool in treatment planning, vocational assessment, and rehabilitation outcome evaluation; as a social policy tool for social security planning, compensation systems development,
and policy design and implementation; as an educational tool in curriculum design; and to raise awareness and take social action (Peterson & Kosciulek, 2005; WHO, 2001, p. 5).

The greatest contribution of the ICF to health care is the opportunity for health care stakeholders, consumers, and providers, alike, to participate fully in ongoing interdisciplinary cooperation to improve health care intervention targeting, helping people with disabilities to maximize their personal achievement and full participation in society. However, it is important to note that as a major classification system, the ICF is in its nascent stages of development.

Research Box 1.1

MAPPING PARTICIPATION


Objective: Participation is a key outcome of rehabilitation and health interventions, yet, there are fewer measures to assess it in community settings than should be the case. The study developed a participation measure (the Ecological Momentary Assessment: EMA) based on the ICF and useful for assessing functioning in everyday settings.

Method: Five adults with mental health and neuromuscular conditions receiving vocational rehabilitation services were participants. They were all residents of a rural community. Participants used personal data assistants (PDAs) with memory cards to record their activity at the prompt of the PDA, which was programmed to allow for comprehensive time sampling of participant activities over the day. Data were collected over 7 weeks.

Results: The EMA was useful for mapping the level and quality of participation in a variety of everyday settings. Participants reported greater community engagement and personal fulfillment based on their self-observations.

Conclusion: Participation in everyday settings can be reliably measured using tools that are time and context sensitive.

Questions:
1. How may self-observation influence data on participation by rehabilitation customers? Consider ways in which the reliability of data from self-observations using PDAs can be enhanced.
2. What alternative methods to measure participation are possible? How would they compare with the use of PDAs?
Future research and implementation efforts with the ICF promise to:
(1) revolutionize the way stakeholders in health care delivery systems think
about and classify health, (2) improve the quality of health care for individuals
across the world, (3) generate innovative outcome-based research, and (4) in-
fluence culturally sensitive global health policy (Peterson & Rosenthal, 2005b;

Linking ICF to Functional Outcome Measures

As advancement in medical technology has resulted in improved treatment of
acute medical conditions and longer life expectancy, the cost of medical care
over the average person’s lifetime has increased significantly (Jaet & McMahon,
1999; Peterson & Aguiar, 2004; Peterson & Elliott, in press; Tarvydas, Peterson, &
Michaelson, 2005). The managed care industry has forced health professionals
to be more outcomes-focused in their reports to third-party payers rather than
reporting only traditional diagnostic information. The ICF provides a system
to document functional outcomes that complement diagnostic information in
health classification efforts.

A variety of health care disciplines have focused on research that links the
ICF to commonly used clinical tests and health outcome measures. Research
has also focused on identifying ICF core sets for use by physicians, nurses, and
others in acute care to help maintain functioning early in the treatment process
(Stucki et al., 2005). ICF core sets are priority categories selected for their ap-
propriateness to address need in specific patient populations, and these core
sets have been developed for patients with cardiopulmonary, musculoskeletal,

Discussion Box 1.3

ICF CORE SETS

The ICF comprises about 1,500 categories and is somewhat cumbersome
to use in everyday rehabilitation settings. To enhance the utility of the
ICF categories, ICF core sets have been developed for several health con-
ditions. ICF core sets have fewer categories that are also clinically most
relevant to the rehabilitation needs of patients or customers with par-
ticular health conditions. However, physicians, nurses, and other acute
care rehabilitation service providers were significantly less reliable and
confident in scoring the items that measured functioning in everyday
settings (Korner-Bitensky, Mayo, & Poznanski, 1990; Gurka et al., 1999;
Turner-Stokes, Nyein, Turner-Stokes, & Gatehouse, 1999), which com-
promised their ability to plan for discharge or to evaluate changes in pa-
tients or people with disabilities that predicted readiness for community
reintegration. ICF core sets would make the ICF more user-friendly, but
measurement problems with service providers require attention.

How would you enhance the reliable use of ICF core sets by a multi-
disciplinary rehabilitation team?
and neurological conditions. The ICF core sets for these patient populations are undergoing trials in Austria, Germany, and Switzerland. Similarly, ICF categories most relevant for evaluating the outcome of health resort programs have been identified and are currently in use in several European countries and Japan (Morita, Weigl, Schuh, & Stucki, 2006). Health resort programs are holiday or respite destinations typically consisting of residential health spa and fitness programming, often with both physical and spiritual components.

Theory Development

The ICF and its conceptual framework can be used to define concepts, build constructs, hypothesize relationships, and propose new theories that will further research and practice well into the 21st century (Bruyère & Peterson, 2005; Bruyère, Van Looy, & Peterson, 2005; Peterson, 2005; WHO, 2001). However, the conceptual framework of the ICF requires further study to establish construct-related evidence for validity (e.g., can relationships between the proposed constructs be hypothesized and tested?) and criterion-related evidence for validity (e.g., can these variables be used to predict health and health-related states?). As data are collected relating various concepts within the model, researchers can explore relationships and research causal links to inform future theory development. For example, do differences between Activity (what a person can do) and Participation (what a person does do) predict future health and functioning?

Mapping the ICF to Seminal Assessment Tools

Ongoing and future research efforts include mapping the ICF onto items within ubiquitous and contemporary assessment and classification instruments in health care (Stucki et al, 2003). The 2005 meeting of the North American Collaborating Center (NACC) focused on efforts to map the ICF to other clinical assessment, evaluation, and classification tools. Attendees represented seven different countries working with the ICF. As these data are agglomerated, various health care disciplines can create bridging texts and documents to facilitate the ICF’s dissemination into their respective classification protocols. Within the area of mental health, the Diagnostic and Statistical Manual of Mental Disorders (4th ed., text rev.; DSM-IV-TR) is currently linked with the ICD-10 codes. Linking its sister-classification, the ICF, would provide classification of functioning within a mental health context that moves beyond multiaxial diagnoses alone to descriptions of health and health-related states (see previous example using depression).

Developing Instruments Based Upon the ICF

Item response theory holds great promise to convert the ICF into measurement systems that individualize the assessment process, reduce respondent burden, and increase measurement precision (Velozo, 2005). Professionals from the disciplines of rehabilitation psychology (DiCowden, 2005), nursing (Coenen, 2005; Harris, 2005), occupational therapy (Velozo, 2005), and physical therapy (Brandt, 2005; Mayo & McGill, 2005) have developed instruments and protocols based upon the ICF model. For example, Velozo (2005) was awarded a National Institute on Disability and Rehabilitation Research (NIDRR) field-initiated grant to develop a computerized adaptive measurement system for the Activity dimension of the ICF.
Concepts and Models

Medical Ontology Research

Olivier Bodenreider (2005), of the Lister Hill National Center for Biomedical Communications, applied the ICF to the National Library of Medicine’s (NLM) Unified Medical Language System (UMLS). The UMLS facilitates the development of computer systems that work with the meaning of the language of biomedicine and health. The NLM produces and distributes the UMLS Knowledge Sources (databases) and associated software tools (programs) for use by system developers in building or enhancing electronic information systems that create, process, retrieve, integrate, and aggregate biomedical and health data and information, as well as in informatics research (U.S. National Library of Medicine, n.d., ¶1). Preliminary efforts have focused on mapping the ICF into the UMLS. ICF concepts were associated with related terms within the UMLS so that in the future the ICF could be cross-referenced with other information systems that are already mapped to the UMLS. Previous UMLS initiatives were primarily influenced by the medical model. The biopsychosocial approach embraced by the ICF has challenged the UMLS to develop new categories to better reflect functional information rather than diagnostic information alone.

Bioinformatics and Medical Informatics

The ICF can provide direction, consistency, and assurance to managing the ever-increasing amount of medical information (Rock, 2005). Chute (2005) suggested that the evolving knowledge base of medical information has outgrown our ability to consume it effectively and that systems like the ICF can help us to develop shared semantics, vocabularies, and terminologies in a way that helps us to use medical knowledge effectively when treating people in health care settings. For example, common taxonomies used between psychiatry, neuropsychology, neurology, physiatry, speech language pathology, occupational therapy, and physical therapy may facilitate better coordination of subacute rehabilitation services provided for people with traumatic brain injury. Chute suggested that while informatics is a very complex area of research, measures and classifications of functioning are the overall metric of organic well-being and, thus, important to include in this evolving research area.

Savova, Harris, Pakhomov, and Chute (2005) presented a method of semantic processing of a portion of the ICF (Self-Care), using Natural Language Processing (NLP) techniques, or computational methods of processing information to autocode text descriptions of health care scenarios. NLP is a subfield of artificial intelligence and linguistics that studies the problems of automated generation and understanding of natural human languages. While their study suggested that some ambiguities existed within the ICF itself, overall, they were able to use the Berkely FrameNet (FN), a computational lexicography resource, to provide relevant and complete coverage for the ICF Self-Care domain.

ICF and Youth

During the ICIDH revision processes of the ’90s, a task force was created to specifically address using the ICIDH with children. Simeonsson et al. (2003) attempted to incorporate the sensibilities needed when classifying youth who are in constant developmental transition, resulting in the ICF-Youth (ICF-Y).
Recent research suggests that the ICF and the ICD-10 can be used together as a common language to document disability characteristics of children in early interventions and in child service systems more generally (Simeonsson, Scarborough, & Hebbeler, 2006). There is need for more research on use of the ICF with children.

Legal and Professional Issues of Clinical Implementation of the ICF

According to Leonardi and associates (2006), in many countries the 2010 census efforts, based upon the recommendation of the UN Population division, will include queries regarding disability status. As national health and disability surveys are established, they predict an increased attention on nonfatal health care outcomes (such as disability associated with aging), necessitating common agreement on the meaning of disability, health, and functioning, which can be facilitated by the ICF’s “consistent and complete conceptualization of disability” (p. 1220).

Research from the ICIDH field trials suggests that training and structured guidance would be useful to future users of the classification system (Reed et al., 2005). To date, most of the 191 member states who are encouraged to use the ICF have lacked such guidance in its clinical implementation. In order to facilitate implementation of the ICF in clinical settings in the United States and allied member states, the American Psychological Association (APA) and WHO formed a series of interdisciplinary team expert groups to develop The Procedural Manual and Guide for the Standardized Application of the ICF: A Manual for Health Professionals. While many have speculated on its date of completion (Daw, 2002; Holloway, 2004; Peterson, 2005; Threats & Worrall, 2004), unanticipated coding issues have delayed its production.

A prototype manual for several ICF chapters was disseminated for field testing (Holloway, 2004), and the results were used on subsequent iterations of the manual. Most recently, the Environmental Factors, the newest addition to the ICF, received increased attention as the APA-coordinated effort progressed. The size of the volume to date (over 800 pages) argues for exploring the utility of using computerized and automated matching systems in employing the ICF (Peterson & Rosenthal, 2005b; Reed et al., 2005). Once the Procedural Manual is published, the guide can be used for training that promotes consistent coding. Further, studies will need to be conducted that evaluate the clarity of the manual, the utility of the manual in clinical practice, and ultimately, the application of the ICF given the new implementation guidelines (Peterson & Rosenthal, 2005b; Reed et al., 2005).

Summary and Conclusion

Assessment is more usable and accurate within clearly specified domains of disability, health, and functioning. The ICF provides a classification system for disability, health, and functioning that would be common basis for locating assessment needs and relating assessment findings from diverse sources to a common framework. The ICF also provides a common language on disability,
health, and functioning that would enhance the quality of treatment by multidisciplinary rehabilitation teams.

The ICF uses a universal, culturally sensitive, integrative, and interactive model of health and functioning that is sensitive to psychosocial and environmental aspects of health and disability and covers the entire lifespan of human development (Bruyère & Peterson, 2005; Peterson & Kosciulek, 2005; Üstün et al., 2003; WHO, 2001). Its conceptual framework presents disability as an interaction between impairment, functioning, and environment and can be used to describe both how environmental factors are key to understanding disability and how advocacy occurs through social change (Hurst, 2003; Peterson & Rosenthal, 2005a). The ICF can be used to identify, mitigate, or remove societal hindrances to the full participation of people with disabilities in mainstream society (Peterson, 2005; Peterson & Rosenthal, 2005a; Scherer et al., 2004). As the ICF is revised based on user evidence, the scope and precision of health care’s conceptions of health, functioning, and disability based on that classification system will be enhanced.

References


